

plate **5026** on the top of the reservoir **5028** with a flexible membrane around the edges. Once filled, the flat plate **5026** distance may be measured at a number of points, for example, in some embodiments; the number of points may be from one to three points, using an optical sensor or, in some embodiments, using a magnetic sensor on a spring loaded protrusion from the pump. To measure 20 units, for example, in some embodiments, may require approximately 0.01 mm to 0.25 mm resolution in height. In some embodiments, standard triangulation may be used to estimate the distance using a linear array and LED, for example. Additionally, a flat plate **5026** may be beneficial for the reservoir **5028** to start with no air.

[1422] Referring now also to FIG. **197**, in some embodiments, a serpentine reservoir, such as the one shown, may be used. In some embodiments, the serpentine reservoir shown may be a tube-like structure with a hydrophobic filter **5030** on the end. The passages, in some embodiments, may be rounded or square and, in some embodiments, constructed of welded TOPAS or polycarbonate plastic. In some embodiments, the reservoir may be filled from one end through a septum **5032**. As fluid is drawn out of the reservoir by the pump, aid is drawn in through the filter **5030**. The filter **5030** may be configured to allow the passage of air but inhibit the passage of fluid or water vapor (in some embodiments, the filter may be a polypropylene filter and/or a filter made from PTFE). In various embodiments, it is desirable to prevent water vapor from passing through the filter/membrane **5030** to avoid concentrating the fluid through evaporation. In various embodiments, the fluid in the passage may be kept in place by the reservoir valve on one end and by surface tension on the other end. In various embodiments, the small diameter of the passage and surface tension at one end may prevent the fluid from “sloshing” which may degrade the fluid, for example, where the fluid is insulin or another therapeutic fluid.

[1423] In some embodiments of the various embodiments of the infusion pump assembly described herein, the pump chamber inlet valve may be an active valve, for example, actuated using shape-memory alloy or other actuated.

Alarm and Alerts

[1424] In various embodiments, the remote control assembly and/or the infusion pump assembly and/or both may include at least one speaker and in some embodiments, the remote control assembly and/or the infusion pump assembly and/or both may include at least one graphical user interface and/or indicator lights. In some embodiments, the remote control assembly and/or the infusion pump assembly and/or both may include reminders and/or alarms and/or alerts to signal to the user either a critical or non-critical condition. The critical or non-critical condition may include, but is not limited to, an occlusion, low battery, low reservoir, change cannula reminder, reminder to check blood glucose, reminder to change glucose and/or interstitial sensor. Therefore, some reminders and/or alarms and/or alerts to signal to the user that a critical, i.e., therapeutically critical, situation is occurring that requires immediate action and/or a situation is occurring that requires the user to be immediately informed. In some embodiments, there are situations that may or have the ability to immediately cause a negative outcome, medically, to the user. However, some reminders and/or alarms and/or alerts to signal to the user that a non-critical, i.e., therapeutically non-critical, situation is

occurring that does not require immediate action and/or a situation is occurring that does not require the user to be immediately informed. In some embodiments, these situations are those that may not or may not have the ability to immediately cause a negative outcome, medically, to the user.

[1425] Thus, in some embodiments, for reminders and/or alarms and/or alerts that signal to the user that a non-critical situation is occurring, the user may program and/or select the mode of notification. In some embodiments, depending on the non-critical situation, a different mode of notification may be used. In some embodiments, all non-critical situations may include the same mode of notification. Thus, in some embodiments, user may select, but are not limited to, one or more of the following modes for one or more of non-critical situations giving rise to notifications:

[1426] 1) “turn on mode” where the graphical user interface lights up and displays a message for a predetermined and/or preselected and/or preprogrammed duration or until the user confirms (e.g., user presses a button or other to indicate they confirm); 2) vibration only mode (vibration for a predetermined and/or preselected and/or preprogrammed duration or until the user confirms (e.g., user presses a button or other to indicate they confirm); 3) vibration then alarm mode (vibrate for a duration and if no confirmation (e.g., user presses a button or other to indicate they confirm), then alarm until confirmation by the user and/or alarm for a predetermined and/or preselected and/or preprogrammed duration); 4) alarm only (alarm for a predetermined and/or preselected and/or preprogrammed duration or until user confirms (e.g., user presses a button or other to indicate they confirm) in some embodiments, after confirmation but no further action, the sequence may repeat; 5) silent until turn on (no indication until the user wakes up the device and then the device indicates, for example, on the graphical user interface, the condition/situation); 6) vibrate only (vibrate for a predetermined and/or preselected and/or preprogrammed duration or until user confirms (e.g., user presses a button or other to indicate they confirm), in some embodiments, after confirmation but no further action, the sequence may repeat; 7) wake up/turn on (i.e., graphical interface/screen lights up/turns on and displays the situation/alarm/alert/reminder) until confirmation, then silent/sleep and/or may repeat sequence if anticipated action not taken in predetermined/preprogrammed/preselected duration). In some embodiments, a silent until wake up may refer to where there is a non-critical condition, the system may not remind and/or alarm and/or alert until the user wakes up the graphical user interface and/or device and, in some embodiments, upon first “wake up” the screen displays the reminder and/or alarm and/or alert.

[1427] In some embodiments, it may be desirable for the user to have the option to preselect/preprogram/predetermine when a non-critical reminder/alarm/alert is given, regardless of the type of reminder/alarm/alert. For example, in some embodiments, the user may request that no non-critical reminder/alarm/alert be given between 11 pm and 6 am, i.e., while the user is sleeping. In some embodiments, this may be termed a timeout. In some embodiments, the user may request a “temporary” timeout for non-critical reminders/alerts/alerts, for example, between 6 pm-8 pm, while, for example, attending a quiet event. Thus, in some embodiments, for non-critical reminder/alerts/alerts the user may do one or more, but not limited to, the following: